Rumex acetosella L.. (Polygonaceae)
Sheep Sorrel, Red Sorrel

Description. Dioecious or polygamous perennials, colonial, from slender rhizomes. Stems 1 to 5 dm tall, erect, simple, glabrous. Leaves alternate, the stipules modified into prominent sheaths, lower leaves petiolate, 2 to 6 cm long, 1 to 2.5 cm wide, blade shape variable, linear to ovate, hastate to sagittate, the terminal lobe much longer than the basal lobes, acute to obtuse, margins entire, the cauline leaves reduced upwards, short-petiolate to sessile, the blades with 1 or no lobes, upper ones sheath-like. Inflorescence 5 to 15 cm long, an open panicle, the branches slender, ascending, glabrous, yellowish to reddish. Flowers unisexual, in clusters, sessile to pedicellate, often somewhat pendulous, perianth parts in two whorls of 3 each, 0.5 to 2 mm long, greenish to reddish, fused near the base, the inner ones expanding and somewhat enclosing the achene in fruit; staminate flowers with 6 stamens; pistillate flowers with 1 superior ovary, the styles 3, the ovary 3-angled, with 1 locule. Fruit a 3-angled achene, 1-2.5 mm long, yellowish to brownish red. In California, flowering from March to July. (Gleason and Cronquist 1991, Hickman 1993, Kaul 1986, Munz 1959, Welsh 1984).

Geographic distribution. A native of Eurasia, sheep sorrel has become naturalized throughout North America, South America, Australia, New Zealand, Japan, southern Africa and Hawaii (Clapham et al. 1982, Fernald 1950, Gleason and Cronquist 1991, Gobbi 1995, Kaul 1986, Munz 1959, Ohwi 1965, Wagner et al. 1990, Webb et al. 1988).

Sheep sorrel was first reported from California (without locality) by Watson (1880), but probably was widely distributed prior to the late 1800s (Jepson 1914, Robbins 1940). It has been reported only from Santa Cruz and Santa Rosa islands (Junk et al. 1997) but occurs widely throughout most mainland California counties (Anonymous 1998, Hickman 1993).

Reproductive and vegetative biology. Sheep sorrel is dioecious, pollinated by wind, but occasionally visited (for pollen) by insects (Proctor et al. 1996, Richards 1986). Seeds may remain dormant for up to 20 years (Tsuyuzaki and Kanda 1996).

Although sheep sorrel represents a polyploid complex (2x, 4x, 6x, and 8x) worldwide, chromosome number does not appear related to ecological distribution nor does it have an effect on sex ratios (Love 1944, Richards 1986). However, because of clonal growth, sex ratios in some populations are often skewed toward one of the two sexes (Houssard et al. 1994, Houssard and Escarre 1995, Richards 1986). Staminate plants are generally shorter, and flower and senesce early, relative to pistillate plants. Pistillate plants are usually larger and have relatively higher reproductive effort, based on flower number. However, Putwain and Harper (1972) showed that the rarer sex often had higher productivity and reproductive capacity, measured either as pollen or seed output. In most cases, ramet growth from root buds contributed much more to to population expansion than annual seed output and recruitment.

Initial establishment of *Rumex acetosella* by seed is relatively rare, but appears favored by reduced competition (at least from grasses) and relatively low nutrient levels (Harper 1977, Mamolos et al. 1995, Putwain et al. 1968). Sheep sorrel is a non-mycorrhizal species, and can expand in the absence of competitive mycorrhizal species after fungicide treatment on nutrient-poor soils (Newsham et al. 1995). Ecotypic variation, combined with phenotypic plasticity, can

result in different genotypes dominanting stages of old-field succession, resulting in long-term persistence as a species (Escarre et al. 1994, Houssard and Escarre 1995, Korpelainen 1993).

Ecological distribution. Sheep sorrel is generally found on moist soils of waste places, open, disturbed sites, or vernally moist meadows and grasslands (Fernald 1950, Gleason and Cronquist 1991, Kaul 1986, Munz 1959, Welsh 1984). *Rumex acetosella* has also been reported from coastal prairie and costal scrub communities (Heady et al. 1988). In South America, it has been reported as a common invasive after grassland fires (Gobbi 1995).

Weed status. Sheep sorrel is not considered a noxious weed in agricultural or horticultural practice, at least at a global level (not listed by Holm et al. 1977), nor is it considered a noxious weed by the State Dept. of Food and Agriculture (Anonymous 1996). However, it is listed for the United States in Lorenzi and Jeffery (1987) and is considered a noxious weed in Australia (Lemerle 1996).

Microbial pathogens. No literature was found that reported *Rumex acetosella* as a host to fungal pathogens. It has been reported as a host to the tomato spotted leaf virus (Bitterlich and McDonald 1993). Migliore et al (1997) documented the uptake of sulphadimethoxine, an antimicrobial compound used in the livestock industry, in sheep sorrel and the potential for ingestion by cattle.

Insect pathogens. No literature was found thar reported insects detrimental to *Rumex acetosella*.

Herbicide control. Harper (1977) reported that sheep sorrel in experimental plots was resistant to paraquat, but effectively controlled by 2,4-D and Tordon. No other literature was found that specifically addressed herbicide control of *Rumex acetosella*. Lorenzi and Jeffery (1987), however, recommended mechanical removal or spot treatment with 2,4-D plus dicamba for low density infestations and glyphosate for large infested areas.

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